

refused any of it during the period of chloride deficiency. The estimated intake of sodium chloride per day is shown in Table III. This does not include the salt content of the milk food (Trufood and Prosol).

TABLE III.—Case II. Showing Estimated Sodium Chloride Intake (apart from the Salt contained in the Dried Milk) and Plasma Cl Levels during the First Week

Date	NaCl Intake (g.) *	Blood Chloride (mg./100 c.cm.)
13/5/45	2.9	
14/5/45	3.4	305
15/5/45	6.4	
16/5/45	4.8	285
17/5/45	10.8	
18/5/45	11.1	321

Comment

It is of interest that both these children were most profoundly ill about 48 hours after operation, with signs of intestinal obstruction, which was relieved when drainage from the ileostomy became properly established.

It is worth pointing out what large amounts of fluid, such as 0.2% saline and dextrose or normal saline, can be taken by mouth and retained by these ill children in addition to fluids given intravenously.

Summary

We report two cases of gangrenous intussusception, of two and a half and four and a half days' duration respectively, treated by a modified type of Mikulicz resection.

We consider that this method of treatment can be expeditiously carried out and that it offers a better chance of recovery in the "bad-risk" case than the ordinary methods of treatment recommended, such as end-to-end anastomosis or lateral anastomosis after resection or enterostomy.

We wish to emphasize the necessity for treating this type of case in a properly staffed and equipped children's department, as we feel that skilful pre-operative and post-operative treatment must play a major part in the recovery of these patients

TRICHOMONAS VAGINALIS INFECTION IN THE MALE

BY

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Major, R.A.M.C.

The frequency of *Trichomonas vaginalis* infection in the female has for many years been recognized, but the similar infection in the male has not received the attention it merits, since it is by no means an uncommon cause of urethritis. During the past few years I have seen numerous cases of this nature, some of which I was fortunate enough to observe over many months, and the results of my investigations are put forward in the hope that with a higher index of suspicion when confronted with a "urethritis," especially one showing a tendency to relapse and chronicity, other workers will discover that many of these cases are due to infection with *T. vaginalis*.

The Organism

The description of the organism as regards size, shape, flagella, etc., may be found in most laboratory textbooks, but I would like to add some personal observations.

(a) *Shape*.—Although usually described as round or pear-shaped, I have seen in some preparations what appeared to be a stoma at the flagellated extremity, suggesting that the organism is in fact globular when not subjected to pressure. The flagella therefore may act primarily as a means of directing food particles into the body of the organism and not for the purpose of locomotion.

(b) *Method of Reproduction*.—It is, I think, generally assumed that reproduction is by simple fission, but on two occasions I have watched for a period of two hours a process best described as "budding." In one case a large organism (parent cell) was attached to a much smaller one (daughter cell) by a bridge of clear cytoplasm, the outer covering of both organisms being continuous. Separation resulted by the stretching and final rupture of this bridge owing to the action

of the flagella of each organism in opposite directions. After separation the daughter cell was morphologically identical with the parent, though much smaller in size (6–8 μ). On the second occasion (one parent and two daughter cells) the same appearances and results were observed.

(c) *The Occurrence of a Resting Phase*.—In some of my cases the active organism disappeared completely from the discharge for periods varying from about one week to two months. During these intervals, however, cells with a "hard" limiting membrane could always be found on dark-ground examination, which suggested that the organism had entered an encysted stage. Differentiation between these cells and some medium-sized epithelial cells is extremely difficult, but a certain facility is acquired by experience. If confirmed this observation of a resting phase is obviously of great importance both in diagnosis and in assessment of cure.

(d) *Method of Demonstrating the Organism*.—For convenience and clarity the dark-ground method is by far the best for the clinician. A drop of normal saline is placed in the centre of a slide. A loopful of the discharge is now dipped into the saline until the fluid takes on a slight opalescence. Recognition of the degree of opalescence necessary comes after a little practice, and I find that holding the slide to the light and looking at the fluid through the glass is of great assistance. A cover-slip being applied, dark-ground examination is carried out in the usual manner.

Pathology

Much divergence regarding the pathogenicity of the *T. vaginalis* is found in the literature: some support its claim as the primary pathological cause, while others look upon it as a parasitic invader following a primary bacteriological infection. Undeniably this latter view is supported by the marked number of organisms found in stained smears of *T. vaginalis* urethritis even on the second day of the appearance of the discharge; in fact, in my department, in any case in which stained smears of urethral discharge show large numbers of organisms the presence of *T. vaginalis* is suspected, and often confirmed. In spite of this, however, I feel that at the moment the problem is best considered in the same light as a Vincent's infection of the mouth, where somewhat similar conditions are necessary for the development of the disease—i.e., dead or damaged organic tissue on which the two organisms flourish together, each being necessary for the development of the other owing to some mutual symbiotic characteristics. This view saves a great deal of useless argument, since either *T. vaginalis* must be first grown in pure culture (or one of the many bacteria present) and shown to produce the disease before the problem can be finally settled.

Turning to the condition in the female, the marked preponderance in young unmarried women is of great interest, and in my opinion one must consider the possibility of extension to the vagina from the bowel in spite of the insistence by some workers on the specific nature of this organism for the vagina. It is well known that cyclical changes (in the vagina) occur, which cause a denudation of the vaginal mucous membrane at regular intervals, and this fact must, owing to poor drainage in young women, bring about a favourable nucleus for the invasion of parasitic organisms. Again, organisms very similar to *T. vaginalis* are often found in the *intestine*, and unless evidence as to the specificity of *T. vaginalis* is beyond doubt, one feels that here at least is a reasonable explanation of the method of infection.

With regard to upward extension of the pathological process, recurrent attacks simulating pyelitis have been common in my experience, but there has been no involvement of the prostate, epididymis, or testis. Cases of prostatitis have been described in the literature, but I doubt if this occurs, since microscopical examination of prostatic fluid (obtained after previous posterior irrigation with two pints of normal saline) always yielded negative results even in the very chronic cases. The possible admixture of anterior urethral pathology with prostatic fluid due to the common, and to be condemned, practice of "milking" the penile urethra after prostatic massage has, I believe, led to such erroneous conclusions. The rarity of stricture (in only one case was a possible previous history of gonorrhoea obtained) is surprising when one considers the chronicity and the marked destruction of the urethral epithelium in this

infection. In my opinion this indicates that the infection is localized purely in the mucous membrane, the submucous coat being unaffected. Concomitant gonorrhoea I have not seen, although I have examined gonorrhoeal pus by the dark-ground method on numerous occasions.

Description of the Condition

The incubation period is about three to four weeks, and the first sign is a feeling of irritation and itching in the anterior urethra. This is followed in 24 to 48 hours by a urethral discharge. On inspection the meatus is of a dull hyperaemic type rather than the brightly inflamed one found in acute gonorrhoea. The discharge, although abundant, is not so profuse as in Neisserian infection, and it has a characteristic "watered milk" appearance, due probably to the high proportion of epithelial cells relative to pus cells in the discharge, and this colour is in marked contrast to the yellowish pus of a true gonorrhoea. Dysuria is absent, and frequency is not a pronounced feature. Urgency I have not seen, even when the 2- or 3-glass test suggested upward extension. The appearance of the urine is rather typical. It is hazy, with innumerable small flakes or specks, this again being an indication of the denudation of the surface epithelium which is so common a feature in these cases. The subsequent course of the infection is one of great chronicity, characterized by waxing and waning of the objective signs and the microscopical picture as indicated earlier in this paper, whether treated by the many methods advocated or merely just allowed to go without any treatment. I am convinced that the discharge may be so slight that the presence of the infection is completely overlooked during the resting-phase period, leading to false optimism of cure until some factors, at present unknown, provoke a recurrence of the discharge. The chronicity of the infection is well illustrated by a case at present under my care, in which everything points to an infection contracted nearly four years ago and which has recurred with monotonous regularity over these years. It may be urged that there is the possibility of reinfection in this case and that the previous attacks may have been Neisserian, but the history of the condition since its origin leaves me in no doubt that the original infection was due to *T. vaginalis*. Other cases observed over two years also lend support to this view. The above description applies to the usual course, but I feel that there are many cases in which the initial infection is so slight that it is entirely overlooked by the patient, until conscience, after an exposure, leads to self-inspection and a slight morning gleet is discovered: examination at a V.D. centre dubs these cases as "urethritis," which leads to frequent attendances and many investigations, and often the correct diagnosis is missed unless the pathology of this disease is thoroughly understood.

It remains for the pathologists to discover the method whereby the *T. vaginalis* can be identified with certainty during its resting phase, as with experience I am finding that cases which showed many active organisms at one visit have for periods up to two months—as one at present under my care—shown nothing but the resting phase. Lack of time has prevented me from devoting much attention to this aspect of the disease. One last point in the clinical description of these cases is that in patients with a long prepuce the preputial mucous membrane sometimes shows the typical salmon-pink appearance often found in the female vagina. Urethroscopic appearances have varied in my hands and, so far as I can judge, there is nothing typical to be seen.

Treatment

Like all chronic conditions, especially when subject to remissions, one finds a multiplicity of "cures." Personally I do not think that at the moment we can claim to have any specific treatment for the condition, since, although many methods advocated do bring about amelioration of the signs, the propensity to relapse is similar to that in the female even when no further exposure is possible. It is essential, therefore, to prolong surveillance over many months, and in my hands the results to date of all treatments, including penicillin and the sulphonamides, have been most disappointing. Recently the administration of mepacrine hydrochloride, both by the usual dosage and by the intensive method now employed for malaria, has been tried, but although the discharge decreased to a very

slight amount and the active organism disappeared from the discharge, the tell-tale resisting cell could still be found on careful search. That drug will, I believe, prove a failure, too, when subjected to the test of long surveillance.

Summary

The results of over two years' investigations and observation of cases of *T. vaginalis* infection in the male are presented above, and although it is only one part of the problem of "urethritis" its importance is stressed, since it has led to frequent invalidism and hospitalization, and the condition is as yet only dimly understood.

HERPES ZOSTER AND CHICKEN-POX

BY

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Herpes zoster is a condition which has excited interest at various times. It has been noticed to occur in epidemic form, and, as one friend in a large general practice observed to me, "If I see one case of herpes I always expect to see several."

Some years ago it was believed—and the belief was shared by that great clinical observer Sir Jonathan Hutchinson—that second attacks of herpes never occurred. This view is no longer upheld. Some years ago I saw at Moorfields a patient with herpes zoster. On being told that the condition was "shingles" he said, "Oh, I had an attack of shingles 18 years ago on my neck." On examining his neck I found the scars of what must have been a pretty severe attack of herpes. I also saw with Dr. Robertson Fullarton a patient with severe post-herpetic pain in the face. This patient had had an attack of intercostal herpes a year before. I saw, too, with the late Dr. Lewis of Hampstead a lady with facial herpes who a year earlier had had an attack of occipital herpes for which Dr. Lewis had attended her.

Herpes, it will be seen, occurs in several regions. The intercostal is probably the commonest, and the cases I have met with in children have all been in this area. It should be mentioned, however, that the condition is never so painful in children as in adults, and the post-herpetic pain, so often very troublesome and persistent in the latter, is usually slight and of brief duration in the former. Besides the intercostal area almost any other nerve area may be the site of herpes, such as the shoulder, the neck, the buttock or thigh, and the face. When it occurs in the face area there is always danger of affection of the conjunctiva and subsequent impairment of vision. In one patient whom I saw with Dr. Melvill Green—the most severe case I have ever seen—three areas were simultaneously attacked—the face area, the shoulder area, and the intercostal. This patient did not recover.

In 1917 Dr. W. P. Le Feuvre published a paper dealing with the association of herpes and chicken-pox, and summed up by urging that herpes, on account of the close and probably causal connexion between the two diseases, should be a notifiable disease. In four years he took notes of 7 cases of chicken-pox in children following herpes in a parent. Three of these cases occurred in his own practice, the others he met with accidentally. He refers to 17 cases noted in the correspondence columns of this *Journal* between May and Oct., 1913, and reference is also given to a paper read by Dr. Bokay at the International Congress of Medicine at Budapest in 1907 in which 9 cases were described similar to those mentioned. These cases, together with two of his own, were published by Dr. Paul Heim in the *Berliner klinische Wochenschrift* in Dec., 1912.

In an analysis of the cases seen or published Dr. Le Feuvre notes three classes: (1) chicken-pox in one individual apparently contracted from herpes in another—41 cases; (2) herpes in one individual who had been in contact with a patient with chicken-pox—5 cases; (3) herpes and chicken-pox occurring simultaneously in the same individual. He also mentions several cases in which a parent the subject of herpes had been warned to look out for chicken-pox in the children. In these cases confirmation of the justice of the warning occurred usually in 14 days.